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Will the Present Upward Trend of World Prices Continue?

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WILL THE PRESENT UPWARD TREND OF WORLD PRICES CONTINUE?

The whole civilized world is now eager to know whether in the future the high cost of living is to advance further, recede, or remain stationary. Opinions are plentiful but data supporting them are few. Even the best forecasts I have seen appear to be based on a very incomplete comprehension of the problem. Many conceive it as a problem of ordinary supply and demand and discuss the general *price level* as they would discuss the *price* of wheat or any other commodity, overlooking the fact that the causes affecting price levels are as distinct from those affecting an individual price as the causes affecting the tides are distinct from those affecting an individual wave.

The problem of the cost of living is primarily a problem of the general level of prices, although it is also partly a problem of special prices. If the phrase "cost of living" were used to refer to the general level of all prices the problem would be purely of the former type and not at all of the latter. But this phrase is usually taken as referring only to special groups of commodities, mostly foods, and only for the retail prices of these commodities. The general level of prices, on the other hand, means the level of *all* prices, whether retail, wholesale, jobbing, factory or farm prices, and of all commodities, whether of food, raw material, machinery, land, stocks, bonds, or any other goods whatsoever which are bought and sold. Now, the "cost of living" will go up and down with the general level of prices and at the same time fluctuate from special causes of its own, just as a buoy in the ocean goes up and down not only with the tides but also with the waves.

The statistics of the past indicate that the recent rise in the cost of living has been for the most part due to the general rise in prices of all kinds, and only to a small extent, if at all, to special causes applying to the retail price of foods. In what follows we shall discuss only the causes affecting the general level of prices

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Those who choose to apply the results to the retail prices of food and other "living" should take account also of the minor and special causes pertaining to these particular prices.

If I am correct in my philosophy of price levels (as stated in my book, *The Purchasing Power of Money*) the general level of prices in the world is determined by the other five magnitudes which are joined with it in "the equation of exchange."[1] No other considerations whatever are relevant—trusts, tariffs, trade unions, shorter hours, limitation of output of labor, exhaustion of the soil, concentration of population in cities, middlemen, advertising, overcapitalization, restrictive legislation, cold storage, pure food legislation, sanitary legislation, food adulteration, the "individual package," extravagance, world armaments, wars, old-age pensions, unemployment, etc.—except so far as these factors affect one or more of the five factors in the equation of exchange which alone can act on the general level of prices. All the causes above enumerated and many more may, of course, affect the price level by affecting these five factors, but not otherwise.

The proper mode of procedure is therefore to make a forecast as to these five factors. Thus far only one of them, the volume of money in circulation, has received much attention, and even the discussion of this factor has not proceeded along the lines proper for a correct forecast. For instance, it is often taken for granted that as soon as the gold production begins to subside the price level will begin to subside also. This is a gross error. The price level does not depend directly on the *rate* of gold production but on the *stock* of gold and other money. The question is not one of an increasing or decreasing annual production of gold. The inflowing stream of gold is of significance only as it affects the contents of the reservoir into which it flows. A lake does not cease rising the instant the freshet filling it reaches its maximum flow. The lake will still continue to rise *so long as the inflow continues greater than the outflow.* This is often long after the inflow has passed its maximum.

[1] For full explanations see *The Purchasing Power of Money* and "The Equation of Exchange [in the United States] for 1911," in this journal, June, 1912. The equation is $MV + M'V' = PT$ in which the letters have the signification indicated at the top of the diagram in this article. In brief M is money in circulation; V, its velocity; M', deposits subject to check; V', their activity; P, the price level; and T, the volume of trade. For reasons given in *The Purchasing Power of Money*, P is to be considered the effect of M, M', V, V', and T.

The problem, then, is to forecast the future world stock of money. But it is more than this. Even if we forecast the world's stock of money, we must still take account of the other four price-influencing factors in the equation of exchange. In particular we must not forget the increasing use of deposit currency by means of checks. This factor, which is certain to play an increasingly important role in future price movements, has been almost wholly neglected in the discussions of this subject.

The problem of forecasting future price levels is, then, nothing more or less than the problem of forecasting the five factors which fix price levels, viz., M, M', V, V' and T. In the article "The Equation of Exchange for 1911 and Forecast" in the June number of this Journal, the statistics of these magnitudes for the United States were given for the years 1896 to 1911 inclusive. The figures for 1896 and 1911 are reproduced. I have added the percentage rates of growth per annum between these dates.

MAGNITUDES IN THE EQUATION OF EXCHANGE AND THEIR RATES OF GROWTH PER ANNUM (FOR THE UNITED STATES).

	Money[1] M	Deposits[1] M'	Velocity[2] (m'n'y) V	Velocity[2] (deposits) V'	Price level[3] P	Volume of trade[4] T	Money expenditure[1] MV	Check expenditure[1] $M'V'$	Total expenditure[5] $MV+M'V'$ & PT
Absolute figures for 1896	0.88	2.71	18.8	36.6	60.3	191	16	99	115
Absolute figures for 1911	1.64	7.78	20.9	49.9	102.2	413	34	388	422
Percentage rate of growth per annum, 1896-1911	4.2	7.3	0.7	2.0	3.5	5.3	5.20	9.5	9.1

[1] Measured in billions of dollars.

[2] Number of times turned over per year.

[3] As a percentage of the price level of 1909.

[4] Measured in units each worth $1 in 1909.

[5] Measured in billions of dollars. This column includes not only "total expenditures" ($MV + M'V'$) but also its equal, "total value of goods purchased" (PT).

We see that the deposits subject to check have increased with great rapidity (7.3 per cent per annum) and that the use of these deposits by checks increased still more rapidly (9.5 per cent). Both far outstripped trade which increased at 5.3 per cent, although trade outstripped money which increased at 4.2 per cent.

In the above mentioned article it was emphasized that we could not fully understand the causes influencing the price level of the United States without considering the conditions in other nations. Problems of money and prices are peculiarly international in their nature and no trustworthy forecast can be made without taking account of world conditions.

Unfortunately, as yet we have no data approaching in completeness those for the United States, by which we can estimate even by very rough approximations the six magnitudes (M, M', V, V', P, T) for the world as a whole. By "the world" is here meant the gold standard world.[2] Rough estimates (about 11 or 12 billions) have been made for the total money in the (gold standard) world, and a rougher estimate (about 15 billions) could be made for deposits subject to check. As to the other magnitudes in the equation, however, we have no clue except the calculations above given for the United States.

But, instead of attempting to estimate the *absolute* values of the six magnitudes in the equation of exchange, we may estimate approximately the percentage rates at which these magnitudes are increasing. Even this estimate will necessarily be rough, but there are so many fragmentary indications or straws which show which way the wind is blowing that the results have, I believe, some value. If the present plan for an International Conference on the Cost of Living should be adopted, one of the most important results would presumably be a completer investigation than is now possible and, in consequence, an exacter estimate of these rates of increase. Possibly it is not too much to hope that we might then be able to ascertain even the absolute values of the magnitudes in the equation of exchange for certain leading nations.

The following[3] statistics show the estimated percentage *rates*

[2] This now includes practically the whole money-using and bank-using world except China.

[3] This table and the other tables which follow in this article are based on data between 1896 and 1911 as available. The data were derived as follows:

M. The rates of increase of the quantity of money in circulation are calculated as the rates of increase of the total quantities of money in the various countries (including bank reserves and government accumulations). They are taken from the Comptroller's Reports for 1897, 1904, and 1911. Forty-six countries are included.

M'. The rates are calculated from "individual deposits" in the United States and corresponding foreign deposits, so far as fragmentary data permit. The data are from the United States Comptroller's Reports, Conrad's *Hand-*

of increase in recent years of the six magnitudes in the equation of exchange for the four foreign countries of chief interest to the United States, together with certain derivative magnitudes. As the figures can be only rough estimates, they are not given nearer than to the nearest half of one per cent.

Country	Recent Percentage Rates of Growth per annum of:									
	Money M	Deposits M'	Velocity of money V	Activity of deposits V'	Price level P	Volume of trade T	Money expenditures MV	Check expenditures $M'V'$	Total expenditures $MV+M'V'$	Total value of goods bought PT
Canada	9	12	½	-1	2	7	9½	11	11	9
Great Britain	½	3½	0	1½	1½	3+	½	5	4½	4½
Germany	2½	13	0	-6½	2½	6	2½	5½	5	8½
France	1	7	0	4	2	3	1	11	5-8	5

The chief errors or discrepancies in this table are doubtless those in the rates found for V'. The reason is that these rates are derived indirectly, by subtracting the rate of increase of M', from the

wörterbuch der Staatswissenschaften, Mulhall's *New Dictionary of Statistics* (edited by Webb), and *The Encyclopedia Brittanica.* Deposits include more or less complete statistics for the United States, Canada, Great Britain, Australia, Germany, France, Austro-Hungarian Bank, Holland, Denmark, Norway, Mexico, Sweden, Switzerland, Russia, Japan, India.

V. Rates here are guesses based on the fact that the previous calculations for the United States show a rate of increase of 0.7 per cent. It is assumed that this rate—slightly over ½ per cent—applies to Canada and, to be conservative, that in all other countries it is negligible. Later we shall give reasons for believing that the velocity of circulation is really increasing although we have no means of knowing at what rate.

M'V'. The percentage rate of increase of *M'V'* (the total check expenditure) is assumed to be equal to the percentage rate of increase of bank clearings. The statistics of bank clearings are taken from the same sources as those of deposits. The clearings used for "France" are only those for Paris. Statistics of clearings for "English Speaking" nations include the United States, Canada, England (London and four other principal towns), and Australia (Sydney, 7 per cent and Melbourne, 5 per cent). The statistics of clearings for "Continental Europe and Japan" include the clearings for Italy (11 per cent) and Austria (15 per cent, comprising Brünner, Prague, Budapest and Vienna).

V'. This is calculated as the excess of the percentage increase in M'V' over that in M'.

rate of increase of $M'V'$; when opposite errors occur in these two magnitudes (M' and $M'V'$) the consequence is a cumulative error in V' which may become either too large or too small. The results, therefore, for V' are believed to have practically no value. Most of the other figures are probably approximately correct. We see that the money in circulation is increasing with great rapidity in Canada (9 per cent per annum) and only slightly in the other countries in the table, that deposits subject to check are increasing with greatest rapidity in Canada and Germany and least in Great Britain, that the volume of trade is increasing twice as fast in Canada and Germany as in Great Britain and France, and that the price level is increasing about 2 per cent per annum in all countries.

$MV + M'V'$. The method of averaging the rates of increase of MV and $M'V'$ so as to get the rate of increase of $MV + M'V'$ has been to weight them by using the estimated relative volumes of deposits and of money in circulation, and remembering that the deposits (judging from the United States) have at least twice the velocity of circulation of the money.

P. Price statistics include not only those separately given in the tables but also Belgium (1½ per cent), Italy (1½ per cent), India (2½ per cent), Holland (1½ per cent). The sources of the statistics of prices are the *United States Bulletin of the Bureau of Labor, Wholesale Prices in Canada, Journal of the Royal Statistical Society, Bulletin de la Statistique Générale de la France,* and *La Curva dei Prezzi Delle Merci in Italia, Negli Anni 1881-1909.*

T. The estimate for the rate of increase in the volume of trade is of course a very rough one, although it has involved more labor than those for all the other five magnitudes put together. It is found by averaging the rates of increase in railroad tons carried, railroad gross receipts, post office letters carried, post office gross receipts, imports and exports (corrected for rate of change in price level, simply by deducting 2 per cent, so as to refer to *quantities* rather than values), and shipping tonnage (entered and cleared with cargoes). These figures are based on data from the sources above mentioned. The statistics for the number of letters are for the following countries only: United States (7½ per cent), Great Britain (3 per cent), Germany (6 per cent), France (2½ per cent), Austria (4½ per cent) and Hungary (4½ per cent). The statistics for exports and imports include those for the United States (3 per cent), Canada (5 per cent), Great Britain (3 per cent), Germany (6 per cent), France (5 per cent), Austria-Hungary (2 per cent), Italy (4½ per cent), Russia (½ per cent), Holland (2½ per cent), Belgium (3½ per cent), Japan (6½ per cent). The shipping tonnage of "other" countries in the next following table includes only Australia, British India and Uruguay. In the case of shipping tonnage under the head of "Continental Europe and Japan" the figures for Japan are lacking.

It will be seen that the figures roughly check each other but that there are some discrepancies. The percentage rates of growth of the two sides of the equation of exchange ought to be exactly equal. This is true of Great Britain where both $MV + M'V'$ and PT are found to be increasing at the rate of 4½ per cent per annum. For Canada $MV + M'V'$ is found to be increasing at the rate of 11 per cent and PT, only 9 per cent. For Germany the rates disagree more, being 5 per cent and 8½ per cent. For France the rate of increase of $MV + M'V'$ cannot be definitely determined. It is an average of 1 per cent for MV and 11 per cent for $M'V'$ and therefore lies between 1 per cent and 11 per cent, but we have no exact knowledge of the relative importance of MV and $M'V'$.

The table shows that deposits are increasing far more rapidly than money. This fact is of great significance, especially in reference to the future trend of prices.

The volume of trade is increasing at rates *less in all cases than deposits*. This is true of the four particular countries in the preceding table, as well as in the United States cited in the former table, and in the various parts of the world given in the table which follows. In all eight instances (United States, Canada, Great Britain, Germany, France, "English Speaking," "Continental Europe and Japan" and "Other Countries") trade (T) is growing more slowly—usually much more slowly—than the use of checks ($M'V'$). In all cases except Canada it (T) is growing faster than money (M) or than the circulation of money (M V); but in all cases it is growing *more slowly* than the total use of circulating media ($MV + M'V'$).[4]

In the following table[5] the whole gold-standard world is included, grouped into three great divisions selected because of differences in the relative use of checks and money. The first group, including "English speaking countries" (United States, Canada, Great Britain and Australia), makes a very extensive use of

[4] This is true unless we except the *uncorrected* figures for Germany, "Continental Europe and Japan" and "Other Countries" for all of which categories the figures fail to check each other up. When these figures are corrected to become mutually consistent, the rates of increase of T are found to be less than of $MV + M'V'$ precisely as in the other cases. For the world as a whole the volume of trade has certainly increased less rapidly than the use of circulating media.

[5] The method of constructing this table is explained in the preceding footnote.

checks. The second, comprising "Continental Europe and Japan," has begun the use of checks, but is still far behind English speaking countries, while the third, "Other Countries" (principally India) makes as yet almost no use of checks. The first three columns, showing the money in the countries and the bank deposits, bring out the contrast at a glance.

Countries	Money in country[1]	Bank deposits[2]	Relative deposits $\frac{M'}{M}$	Recent Percentage Rates of Growth, per annum of: Money M	Deposits M'	Velocity of money V	Activity of deposits V'	Price level P	Volume of trade T	Money expenditures MV	Check expenditures $M'V'$	Total expenditures $MV+M'V'$	Total values bought PT
English Speaking	4.8	26.0	5.4	3.5	8	½	0	2½	5	4	8	7½	7½
Continental Europe and Japan	6.2	2.9	.5	2	8	0	1	2	6	2	9	4-6	8
Other countries	1.7	.3	.2	½	9½	0	0	2	8	½	9½[3]	1-3	10
All gold standard countries	14.7	29.2	2.0	2½	8	½	0	2	5½	3	8	7	7½

[1] In billions of dollars.

[2] Incomplete; in billions of dollars.

[3] In the absence of data for clearings, the rate of growth of $M'V'$ is taken as equal to the percentage growth of deposits.

It will be noticed that the figures for "All gold standard countries" mutually verify each other, that is, the relative rate of increase of the left side of the equation (7 per cent) is approximately equal to the rate of increase on the right side (7½ per cent). In the case of English speaking countries the agreement between the two sides of the equation is perfect, each showing a rate of increase of 7½ per cent. In the other two items in the table, however, there is a wide discrepancy between the two sides of the table. The results (for "Continental Europe and Japan") would seem to show a rate of increase in the left side of the equation of from 4 per cent to 6 per cent per annum and in the right side of 8 per cent. The discrepancy of "Other Countries" is still greater, the left side showing an increase of only from 1 per cent to 3 per cent per annum, while the right side shows an increase of 10 per cent. I have no doubt that these discrepancies are due almost entirely to errors in T. As explained in the footnote to the first table, the rates of increase of T are taken as an

average of the rates of increase of railroad tons carried, railroad gross receipts, post-office gross receipts, imports and exports (quantites) and shipping tonnage. These items naturally show a great rate of increase in countries where the railway, the post office and the steamship have not been in use long enough to have approached as yet their full development. Like most young organisms they grow especially fast and consequently are not good indications of T. The growth of the railroads is not a good indication of the volume of trade for countries like India, though it may be a fairly good index for the volume of trade for the United States, Great Britain and Europe. In countries where these inventions are now being introduced the rate of growth represents chiefly the development of these particular inventions, and not simply the growth of business in general, while in the countries where the railroad, post office and steamship have already reached nearly their full development or maturity, their growth depends chiefly on the growth of business in general. In view of this consideration, the fact that the figures for the rates of growth of the volume of trade (T) are greater in "Continental Europe and Japan" than in "English Speaking Countries" and are still greater for "Other Countries" casts no discredit on the other figures of the table.

The figures for the United States which are included in the last table were worked out by the same rough method as for the other countries. The results in general agree fairly well with those obtained by the more exact method employed in the June article and summarized in the beginning of this article. This agreement increases our confidence in the other figures in the table.[6] The agreement is especially satisfactory for the chief magnitudes MV, $M'V'$, and PT.

[6] The full comparison of the figures for the United States calculated by the "rough" and "exact" methods is as follows in percentages:

	M	M′	V	V′	P	T	MV	M′V′	MV+M′V′	PT	$\frac{M'}{M}$
Rough	4½	10	½	-2	2½	6½	5	8	7½	9	5
Exact	4.2	7.3	0.7	2.0	3.5	5.3	5.0	9.5	9.1	9.1	2.8

The worst discrepancy is in V' the rate for which by the rough method shows a negative result. The latter is clearly an error and is probably due, in accordance with previous explanations, to the cumulative effect of two errors, one in the "rough" rate for $M'V'$ (8 per cent) which is too small, and the other in the "rough" rate (10 per cent) for M', which is too large.

If, now, the "exact" figures for the United States be substituted for the "rough" figures, the results for "English Speaking" and for "All gold standard countries" will become slightly changed. The changes which will thus be produced in the figures for "All gold standard countries" will be seen in the second line of the following table. The first line repeats the original calculations given above, while the third line gives the final estimates obtained by making arbitrary mutual adjustment.[7] No figure for any of the primary magnitudes, M, M', V, V', P, T, has been altered by more than one half per cent.

THREE APPROXIMATIONS FOR PERCENTAGES, "ALL GOLD STANDARD COUNTRIES."

	M	M'	V	V'	P	T	MV	M'V'	$\frac{MV}{M'V'}$	PT	$\frac{M'}{M}$
Original calculation	2½	8	½	0	2	5½	3	8	7	7½	5½
Revised by "United States exact"	2½	7	½	2	2½	5	3	9	8	7½	4½
Finally adjusted	2½	6½	½	1½	2½	4½	3	8	7	7	4

The last line contains the final conclusions as to the growth of those world conditions directly affecting the price level. We see that world prices have been rising about 2½ per cent per annum; and that this is due to the fact that the total circulation of money and checks ($MV + M'V'$) grew 2½ per cent faster than the

[7] In making these adjustments I have exercised my own discretion and taken account of other considerations besides merely making both sides agree. In particular, I have adjusted T downward because, as already indicated, the T rates are in general exaggerated.

In the United States the volume of trade (T) is increasing at the rate of 5.3 per cent per annum; and since our population is increasing at the rate of 1½ per cent per annum, the increase *per capita* is only about 4 per cent. It does not seem likely that the increase *per capita* in many other lands would be greater than in the United States, while the increase in population is less, being only 1 per cent. On this basis we would conclude that the rate for the world would not be over 5 per cent and may be considerably less. The T rates as first worked out averaged 5½ per cent. But these included a rate for the United States, reached by the rough method employed for other countries. This roughly calculated rate for the United States was 6½ per cent, whereas the true rate, according to the far more trustworthy data previously employed was 5.3 per cent. Using this more exact figure in place of 6½ per cent, we found the average rate for the world to be 5 per cent in place of 5½

volume of trade (T), the growth of circulating media being 7 per cent per annum and the growth of trade being only 4½ per cent per annum. The 7 per cent growth of circulating media was, in turn, due principally to the growth in check circulation ($M'V'$) which advanced 8 per cent per annum. This 8 per cent growth in check circulation was, in turn, due chiefly to the growth of deposits (M) which advanced 6½ per cent. Of this 6½ per cent growth of deposits, in turn 2½ per cent was due to the increase of money (M) and the balance, 4 per cent, to the outstripping of money by deposits, *i.e.*, to the growth of *relative* deposits $\frac{M'}{M}$

Forecast for the Gold Standard World

As previously stated and elsewhere emphasized,[8] M', the volume of deposits subject to check, tends to keep pace with M, the quantity of money in circulation. It follows that a part of the increase in M' is due to the increase in M. Consequently also a part of the increase in M' V' is due to the increase in M. It is well to bear this in mind, for the principal importance of the increase in gold production lies in its effect on M'. The mere increase in M alone would be relatively unimportant. If M, instead of increasing 2½ per cent, had not increased at all, M' would not have increased 6½ per cent but only 4 per cent. In that case there would have been no increase in the price level. So also, if in the future M should suddenly cease increasing while M' relatively to

per cent. But even this does not sufficiently allow for the exaggeration in our index of T, since that exaggeration probably applies to all other countries, unless possibly England and France, where the post office and railway business has not been greatly extended except in specific response to the general growth of business. In both these countries the T rate is calculated at 3 per cent. But in all other countries the results are doubtless exaggerations. We have already presented *internal evidence* of this in the great discrepancy between the estimates in the two sides of the equations, in "Continental Europe and Japan" and in "Other Countries." In the former the excess of the side of the equation on which T is found is 2 per cent to 4 per cent, while in the latter it is from 7 per cent to 9 per cent. In the United States the excess was 1½ per cent. Taking all these considerations into account, I feel safe, when making the final adjustments, in trimming down the T rate from 5 to 4½ per cent. It is believed that the final estimate is in general correct within less than one point (one per cent of growth). This is not a high degree of accuracy but it represents, I believe, a better basis for forecasting the future than any which has hitherto been employed.

[8] See *The Purchasing Power of Money*, chs. 3, 8.

M should continue the same rate of increase and T also should increase at the same rate, the price level would remain stationary.

For reasons to be given I believe it is fairly safe to say: (1) that M' will, for many years, increase as fast relatively to M as it has in the past, (2) that M, V, and V' will increase at least to *some* extent (even if only as fast as population) and (3) that T will not increase faster than at present. If these conclusions are correct it follows that the price level must rise in the future.

We shall examine the prospects in detail for each of the magnitudes M, M', V, V', and T.

M. The principal cause in recent years for the increase of money in circulation has been the great output of gold. This output has been a remarkably steady percentage ($4\frac{1}{2}$) of the world's stock of gold.[9] Analogy would lead us to expect a continuance of this rate in the future. But analogy is an unsafe guide. Some gold mining experts like de Launay add their testimony in favor of continuation. Others, like Mr. George E. Roberts, Director of the United States Mint, think the chances are that the maximum will be reached in a few years. There are always, of course, chances of new discoveries or methods of production and chances of exhaustion of mines, although the exhaustion of mines is readily foreseen several years in advance, while the discovery of new mines or methods can never be definitely foreseen. Leaving out of account the chance of great discoveries which always exists, the output is fairly sure to remain great even if it ceases to increase or to increase at the present rate.

There is, of course, a tendency for the increased gold production automatically to check itself, since the increase in wages and other expenses which are caused by the increased quantity of money, makes the working of the mines themselves more expensive. Director Roberts, who is one of the best informed men in the world on this subject, in his 1911 report, states:

"It has been a theory of writers on the subject that the rise of commodities and wages would automatically check the production of gold, thus providing its own corrective, but the gold-mining industry furnishes an illustration of how invention, organization, and the use of capital are able to accomplish a reduction in costs when every factor in the calculation shows an advancing tendency. The cost of handling ore and extracting gold in the Transvaal mines per ton of ore treated has steadily declined and made a new low record in 1910." . . . . . "While it is not likely that the Rand will show an appreciable

[9] *Moody's Magazine*, March, 1912.

decrease for a good many years to come, it is probably not far from the maximum output. There has been no gain in the world's production for some years except that made by the Rand."[10]

We conclude then that, so far as the future production of gold is concerned, it is not safe to predict any great future increase although it would be still less safe[11] to predict a decrease. It seems safe only to say that the production of gold will not decrease fast nor suddenly and that whether or not its production decreases at all, gold will for many years still be produced in sufficient quantities to create a net addition to the world's money and bank reserves of, let us say, at least 2 per cent per annum, or one half per cent less than the present rate. It seems unlikely that the rate of increase of money stock will fall much below this.

The fact that the gold standard world is now so large tends of course to lessen the effect of fresh supplies of money, but these supplies are also large while bank deposits are becoming a more and more dominant feature. There was a time when the Orient acted as a "sink" of the precious metals and to some extent it does so still. India has been yoked to the gold standard since 1893-1898 and this fact has doubtless mitigated the rise of prices which the world has experienced since 1896. What Professor J. Stanley Jevons said of India, when gold and silver countries were united through bimetallism, holds true today when India is linked to gold standard countries through the "gold exchange standard." He said:

"Asia, then, is the great reservoir and sink of the precious metals. It has saved us from a commercial revolution and taken off our hands many millions of bullion which would be worse than useless here. And from the earliest historical ages it has stood in a similar relation to Europe. In the Middle Ages it relieved Europe of the excess of Spanish-American treasure, just as it now relieves it of the excess of Australian treasure."[12]

According to the Director of the Mint, for the eleven years 1900-1910, India absorbed 434 millions of gold and, for the British fiscal year ending March 31, 1911, the net imports were 90 million dollars, or about one quarter of the world product after the industrial consumption was provided for. A correspondent of the Director of the Mint writes:

[10] *Report of the Director of the Mint for 1911*, p. 67.

[11] How hazardous it is to set a limit to gold discovery is well illustrated by the prediction of the Austrian geologist, Suess, fifteen years ago, that gold production had reached its climax and would decline!

[12] *Investigations in Currency and Finance* (London, 1884), p. 137.

"The net import of gold into India for the month of February, 1912, is a fresh record and amounts to the substantial sum of £5,174,600. This total is more than double that for February, 1911, and represents nearly one-sixth of the whole Rand output for 1911. The bulk of this large sum was imported in the form of sovereigns which were available for circulation if the country so desired."

Yet India has not prevented the world rise of prices and she has herself shared this rise, at the rate of about 2½ per cent per annum, as the statistics of Atkinson show. Even if China should follow the example of India and introduce the gold exchange standard, the effect in steadying prices would probably not be great; for China, like India, though large in population, is small in its use of money per capita. Excepting China there now remains no important country which can relieve the present gold standard world of redundant gold. Nor is gold the only source of addition to monetary stock. If the plan of the National Monetary Commission should be adopted or, for that matter, any other plan likely to be considered for improving our currency, the result must inevitably be to inflate the currency. It would also get rid of our present uneconomical use of bank reserves and substitute a system which would virtually release reserves now locked up. The tendency of all these changes (however desirable on other grounds) would be to raise prices. When, therefore, we consider all the possibilities—the chances of new discoveries of gold or of further economies in gold mining, the certainty of a continuance of an enormous annual extraction of ore actually "in sight," the chances of increases in paper money and subsidiary coins—we may well feel confident that gold production will not slacken enough to bring the upward movement of prices to a standstill. In order to arrest this upward movement of prices, the gold production would practically need to cease altogether so as to make the money in circulation (M) remain stationary; for the figures given show that M is now increasing at the rate of 2½ per cent which is the same rate as P is increasing.

V. Next let us consider the prospects for the velocity of circulation of money. We have assumed that the velocity of circulation of money in the world will only feebly increase, this assumption being based on the calculation made above for the United States. It is safe to say that the rate of increase could not be much lower than that assigned and it may be somewhat higher. In fact there is much to be said in favor of the latter view. The extension of rapid transportation will tend powerfully in this di-

rection especially in slow and backward countries like India. Again the extension of banking tends in the same direction. Where banking does not exist, money is hoarded, *i.e.*, circulates slowly. Where banking is introduced, money is deposited and finds its way into circulation. No one will, I think, deny that, for many reasons, hoarding is constantly on the decrease, and a decrease in hoarding means an increase in velocity of circulation. It was not long ago when French people stowed away large sums of money in stockings and other domestic receptacles. These were their chief savings banks, and savings meant hoards. But today all money not needed for immediate use is generally deposited in some sort of bank, whether a savings bank or an ordinary bank of deposit, and is thence returned by that bank into circulation or used as a reserve for several times its value in deposits subject to check. In either case the effect is virtually to inflate the currency.

We may, I believe, expect such a release of oriental hoards in the future. The astonishing lengths to which hoarding is now carried in Egypt and India are emphasized by Director Roberts of the United States Mint. He says:

"The Egyptian situation is somewhat like that of India. The country is on a gold basis, and for 30 years has been steadily taking gold in the settlement of its trade balances. The high price of cotton in recent years and the increasing production of the country explains the trade balances, but there is some mystery about the way the gold disappears from view. It does not enter into bank stocks, and it is difficult to understand how a country of its size and population and in which the masses of the people are so poor can absorb so much gold coin. . . . Some light is shed upon the situation by the following statement in an address by Lord Cromer, made in London in 1907:

'A little while ago I heard of an Egyptian gentleman who died leaving a fortune of £80,000, the whole of which was in gold coin in his cellars. Then, again, I heard of a substantial yeoman who bought a property for £25,000. Half an hour after the contract was signed he appeared with a train of donkeys bearing on their backs the money, which had been buried in his garden. I hear that on the occasion of a fire in a provincial town no less than £5,000 was found hidden in earthen pots. I could multiply instances of this sort. There can be no doubt that the practice of hoarding is carried on to an excessive degree.' " (*The Statist,* Nov. 2.)

The amount of such hoards has been emphasized by Director Roberts of the United States Mint as evidence that they provide a future sink for gold and thus tend to absorb gold, and perhaps arrest the rise of prices. There can be no doubt that oriental hoarding will continue for years to afford an outlet for redundant

gold, and so tend to mitigate the resultant rise in prices. But there is no reason to think that such a cause can stop the rise. The weakness of such an argument lies in the tacit assumption that the influence of hoarding will be more powerful in the future than in the past, whereas the opposite is likely to be the case; and in the past it has not been sufficient to prevent a rapid rise of prices. In the future we must reckon with a lessening tendency to hoard and an increasing tendency to gradually *unload* ancient hoards. Just as, with the introduction of banking, hoarding long ago went out of vogue in England, and more recently in France, so it must surely, if slowly, go out of vogue in India and Egypt. The transformation will take place as these countries gradually introduce occidental banking. Already there is a rapid growth of banking in these countries. Thus in Egypt postal savings bank deposits increased from $190,000 in 1901 to $2,250,000 in 1910, and in British India, from $35,000,000 in 1899 to $51,000,000 in 1910.[13] Similarly the *Statistical Abstract,* relating to British India (p. 97) shows that deposits in twenty-one banks have more than doubled in nine years, reaching $180,000,000 in 1909.

The same principle applies to oriental hoards in the form of ornaments. Centuries ago Englishmen used to put part of their hoards into "plate" which could be reconverted into coin if emergency required. With the advent of banking devices such a custom has long since disappeared. It is to be expected that little by little the same process will turn part of the oriental hoards of ornaments into monetary use. Thus, as a consequence of the introduction of western civilization into the Orient, we have the prospect of further additions to the effective use of the world's gold, a further virtual inflation of the currency.

Director Roberts says:[14]

"There is an undoubted tendency in all countries to use banks more than formerly, and it is probable that the stock of gold in banks has been recruited not only from new production but to some extent from gold heretofore held in private hoards and out of use. In every country the younger generation to whom these hoards descend is likely to put them to some use."

Similarly government hoards and even bank hoards seem likely in the future to decline or at any rate to cease being accumulated. A decade and more ago gold was so scarce as compared with the

[13] *United States Comptroller's Report,* for 1911.

[14] *Ibid.,* p. 61.

demands made upon it that a large part of the early additions to the world's stock were absorbed to strengthen weak reserves and government hoards and to replace silver and paper. About a billion of gold has been accumulated by the United States in the last ten years and about half a billion by Russia and France. Moreover, Japan, Argentina, Brazil and Mexico have absorbed much gold. India, Mexico, the Philippines, Panama and the Straits Settlements have made demands on gold to sustain their "gold exchange standard." An economist of note writes:

"The effect in raising prices I think, however, would have been vastly greater than it has been had not the United States, Russia and Egypt been hoarding gold and thus employing it uneconomically."

These demands on gold have now been so far satisfied that in the future any addition to the world's stock will be freer to act on prices both as a circulating medium and as bank reserves. This means that what may be called the "virtual velocity of circulation" of money will be increased.

M'. We come next to the volume of deposits subject to check (M') and their velocity of circulation or "activity" (V'). These together constitute the use of checks ($M'V'$). Perhaps no factor has been so greatly neglected or underestimated in importance as the use of checks. When once it is recognized that deposits subject to check are a form of currency similar in function to bank notes,—nay, are today the *chief* form, the discussion of the price level will assume a new phase.

As was shown in my June article, in the United States the volume of check transactions forms 92 per cent of all transactions. Probably something like this ratio obtains in Canada and England. Outside of English speaking lands, however, the ratio is undoubtedly much less. If we could assume that the volume of check transactions actually maintained a constant ratio to that of money transactions, the circulation of checks would not then have to be reckoned with as an independent factor. Some day in the future, when the use of checks has grown up to its work, it would not be strange if the ratio of checks to money should remain fairly constant. At present, however, we are passing through a long transition period during which the device of using checks instead of money is being extended with prodigious rapidity. This is the dominant feature of the present situation and forms the chief basis of the forecast here attempted. All nations—even those which have used checks for generations—are making a continually larger

use of checks relatively to money. As the last table shows, the use of banking devices is increasing much more rapidly than the volume of money. The volume of deposits is increasing at the rate of 6½ per cent per annum. Even in England where checks have been used for so long a time, the volume of deposits is still increasing at the rate of 3½ per cent per annum; in the United States, at 7.3 per cent; in Canada, at 12 per cent; and in Australia, at 3½ per cent. These are English speaking lands, in which, if anywhere, the use of checks should have approached its limit. No such approach is observable in the United States or Canada and the data for Australia are too meager to be considered representative.

In "Continental Europe and Japan" there is certainly no tendency to decrease. Here in the next few decades is a vast region for the extension of deposit banking. It would not be surprising if, in Germany and other continental countries, the use of checks should reach a stage when every business man would begin to realize that he must employ them. Then the use of checks would increase at an even more rapid rate than at present. At present the rate of increase in France is 7 per cent, in Germany 13 per cent, Holland 9 per cent, Denmark 10 per cent, Norway 8 per cent, Sweden 5½ per cent, Switzerland 5 per cent, Russia 2½ per cent, Japan 10 per cent, the Austro-Hungarian Bank 17 per cent. In backward India where deposit banking has only just begun, the rate of increase is 9 per cent, in Mexico 11 per cent. Should only the present rate of increase be maintained, while the rates in English speaking lands should slacken, the average rate for the world would not necessarily or even probably decline. At present the deposit currency of the United States far exceeds that of other countries, but the deposit currency of Continental Europe and Japan will cut more and more of a figure, and by the time—perhaps a generation hence—when their rate of increase begins to slacken, India and other of the (now) backward countries in the third group of the last table will then need to be reckoned with. The present relative positions of these three groups are shown roughly by the ratio of deposits to money in the country as given in the last table but one. In the English speaking group deposits are almost five times the money in the country. In the next group—Continental Europe and Japan—on the other hand, the figures show that deposits are only half as great as the money, although this ratio may be too small if, as is likely, the statistics

of deposits are more defective than those of money. The third group shows money to be only one fifth of the deposits although there is the same probability that this ratio is too small also. Unfortunately neither the figures for money nor the figures for deposits which were used in forming these ratios, exactly represent the M and M' of our table. The money in the country includes money in banks and government vaults, while the deposits include many deposits which are not subject to check. Yet in a general way we may believe that the relative importance of money in circulation and deposits subject to check is approximately represented in the table.[15] At any rate the obvious lesson of the figures is a prodigiously rapid expansion of deposit-banking throughout the world.

V'. We come next to the activity of deposits subject to check. In the United States this has shown a progressive tendency to increase. As the factors—concentration of population in cities, rapid transportation, etc.—which tend to increase V' are constantly increasing, we may expect this factor to increase for other countries also. That concentration of population in cities is a very powerful influence in accelerating the activity of bank accounts is shown clearly by the figures of Pierre des Essars and myself. The activity of deposits varies almost exactly with the size of the cities and the range of variation is surprisingly great. This exceeds 100 times a year in Paris, Berlin and Brussels, but is only 16 times a year in New Haven, four times a year in Athens, Greece, and only once a year in Santa Barbara, California.[16]

These results accord with the fact that the velocity of circulation in the United States has increased very substantially during the last fifteen years—from 37 times a year to 50 times a year.

Finally, we have the testimony of the statistics of clearing-houses. The rate at which these increase is used as a rough indication of the rate at which the use of checks ($M'V'$) increases. As the figures in our tables show, clearings usually show a more rapid rate of increase than deposits. This indicates that the use

[15] In the United States the money in circulation is only about half of the money in the country, and the deposits subject to check are likewise about half, so that the true ratio, 4.7, of M' to M, turns out to be exactly the same as the ratio of deposits to money in the country as calculated by the rough method used in the table.

[16] See "La vitesse de la circulation," in *Journal de la Société de Statistique de Paris,* April 1895, p. 148, and *The Purchasing Power of Money,* p. 87.

of checks is increasing faster than the deposits against which they are drawn, which means that the activity of these deposits is increasing. It is true that this is not definitely indicated by the figures for all countries; but, judging from the facts in the United States, it is probable that the raw figures for the growth of deposits overstate the rate of growth of deposits subject to check, while those for clearings understate the rate of growth of the use of checks.

T. Finally we come to the volume of trade. This is the one factor which acts to restrain the rise of prices. Doubtless the volume of trade will continue to increase in the future, but there seems to be no evidence to lead to the conclusion that it will increase at a more rapid rate in the future than at the present time; and no evidence that it will, as long as the present development of banking continues, outstrip the expansion of media of exchange. On the contrary, there is some reason to believe that trade, while it will continue to expand, will expand more slowly. The fuller occupation of our lands and the decrease in the rate of growth of our population, which is partly a consequence of this occupation and partly a consequence of the voluntary decrease in the birth-rate, should tend to curb the rate of increase. Certain inventions pertaining to transportation will doubtless cause long distance and international trade to increase greatly, but such trade constitutes only the outer fringe of the great mass of trade. For the United States, for instance, the whole foreign trade is less than one per cent of the internal trade. The great bulk of trade consists of *local* transactions. Local trade is affected by transportation but not affected so greatly as long distance trade. Thus rapid transportation has caused a prodigious increase in the trade between the antipodes, a less increase in the trade between the states of the United States and a still less increase in the trade between individuals in the same town. Improvements in transportation always help trade, but the connection between transportation and trade is a loose one so that probably the growth of transportation always outstrips the growth of trade.

After a careful weighing of all the evidence available I have been unable to escape the conclusion that, in the race between $MV + M'V'$, the purchasing power of both money and deposits, on the one hand, and T, the volume of trade, on the other, the outlook is that the former will continue for many years to outstrip the latter.

The weight

symbolizing a purse, represents M, the money in circulation.

The leverage of this purse, or its distance from the fulcrum, represents V, the velocity of circulation of money.

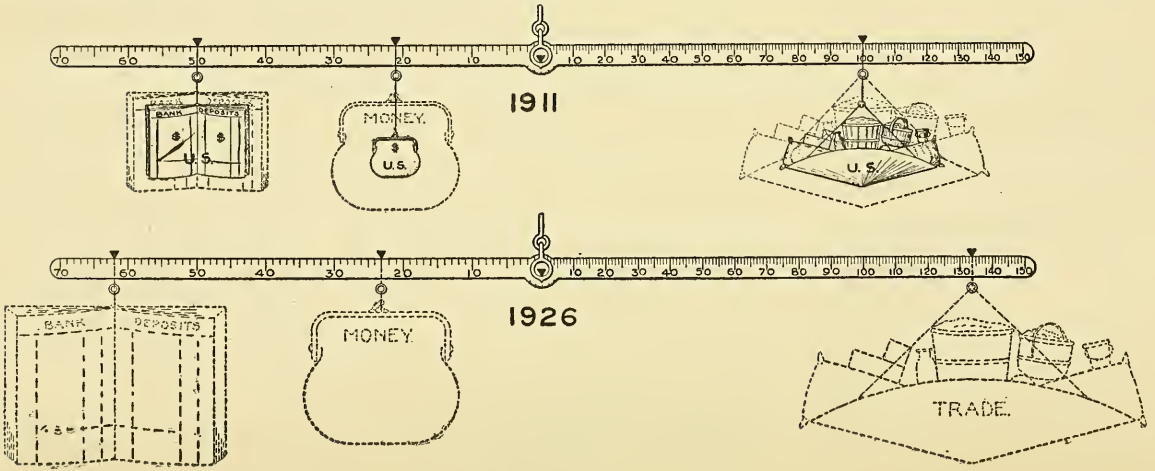
The weight symbolizing a bank book, represents M', the bank deposits against which checks are drawn.

The leverage of this bank book represents V', the velocity of circulation ("activity") of these deposits.

The weight

symbolizing a grocer's tray, represents T, the volume of trade.

The leverage of this tray represents P, the index number of prices measured as a percentage of the prices of 1911



Hypothetical Representation of the Equation of Exchange for the Gold Standard World

If this conclusion is correct, then prices must, on the average, continue to rise.

In all the above discussion we have considered only the *rates* of increase of these factors, and not their absolute magnitudes. As has been indicated, this was done because as yet data are lacking by which to make any reliable estimate for the various magnitudes in the world's equation of exchange. In order, however, to provide some sort of mental picture of the changes in the various magnitudes, the accompanying illustrative table and diagram are given.[17] The figure used for M in 1911 is probably approximately correct and that for M' correct within a few billions of dollars. The figures for V and V' are simply the figures for the velocities of circulation in the United States. That they are representative of the world at large is not and could not be claimed. We know nothing of the absolute magnitude of these factors in the world as a whole.

Assuming these hypothetical values for the six magnitudes in the world equation of exchange for 1911, we can picture what their values will grow to in fifteen years under the two hypotheses represented as "probable" and "conservative." The "probable" hypothesis indicates what will happen if all the factors grow, as recent experience and present prospects indicate to be most probable. The "conservative" hypothesis indicates what will happen if the growth of the four price-raising factors, M, M', V, V', is *as slow as could reasonably be assumed*, while, at the same time, the growth of the one price-restraining factor, T, is *as rapid as could reasonably be assumed.*

The rates selected for the "probable" case are those indicated by recent experience except (1) that the rate for M is reduced from 2½ to 2 to provide for the probable gradual falling off in the rate of increase of money and (2) that, as a consequence of this reduction in M, there will be an equal reduction in M' from 6½ to 6. It will be seen, therefore, that, although I have called these figures "probable" as distinguished from the others which are called "conservative," the former might perhaps be called conservative and the latter, ultra-conservative. The conservative character of the "probable" estimates is illustrated by the figures for deposits. The rate of growth of bank deposits which is called

[17] The diagram is constructed on the same principles as those in the June article and *The Purchasing Power of Money.*

"probable" is less than the rate (7.3) in the United States. This is due chiefly to the low rate (3 per cent) in England. But before fifteen years are up "Continental Europe and Japan" will cut so large a figure in the average that the low rate in England will have less weight and the high rates of Germany and other countries, now relatively insignificant in their volume of deposits, will have more weight. The result may well be that the world's average rate of increase of deposits will be greater in the future even if the rates in some or all individual countries should become less.

HYPOTHETICAL FIGURES ILLUSTRATING FUTURE GROWTH
(FIGURES FOR THE ABSOLUTE SIZE OF M, M′, AND T ARE IN BILLIONS OF DOLLARS)

	Money in circulation M	Deposits subject to check M'	Velocity of money V	Velocity of deposits V'	Price level P	Volume of trade T	Money expenditures MV	Check expenditures $M'V'$	Total expenditures $MV+M'V'$	Relative deposits[3] $\frac{M'}{M}$	Relative money expenditures[4] $\frac{MV}{MV+M'V'}$
Assumed for 1911	12	15	21	50	1.00	1000	250	750	1000	1¼	25
Future rates of growth: Probable[1]	2	6	½	1½	2	4½					
Future rates of growth: Conservative[2]	1½	5	0	1	0	5					
Results in 15 years: Probable[1]	16	36	23	62	1.34	1940	370	2230	2600	2¼	14
Results in 15 years: Conservative[2]	15	31	21	58	1.02	2080	315	1800	2115	2	15

[1] By "probable" is meant: "In case all five price-determining factors grow as recent experience and present prospects indicate to be most probable."

[2] By "conservative" is meant: "In case all price-raising factors (M, M', V, V') grow as slowly as could reasonably be assumed and the price-restraining factor (T) grows as fast as could reasonably be assumed."

[3] Relatively to money in circulation.

[4] As percentage of total expenditures.

The rates selected for the "conservative" case are for M, V and V' reduced by half a point from those of the "probable" case, that for M' reduced one point (*i.e.*, reduced half a point because of the reduction of a half point in the M rate and another half a point on its own account) and that for T raised half a point.

The "probable" figures illustrate, what has already been implied, that the outlook is for a rise of prices of 2 per cent per annum or from an assumed 100 per cent in 1911 to 134 per cent in 1926, *i.e.* a rise of one third in the next fifteen years, while on the most

conservative basis the price level will not fall. Humanly speaking, I believe it is certain that prices will not show a downward trend in the next fifteen years. There seems to me to be less than an even chance that any *one* of the five factors should be as extreme as supposed in the "conservative" case. Much less is it likely that they all should be. But even if there were an even chance (*i.e.*, a chance of $\frac{1}{2}$) that each of these factors, taken by itself, should deviate from the "probable" as much as indicated in the "conservative" case, the chance that *all five should do so at the same time* would be extremely small, viz., $(\frac{1}{2})^5$ or one chance in 32. The true chance is probably considerably less than this. On the basis of the theory of probability, I am inclined to believe that the chance that prices will not, in general, rise during the next fifteen years is less than one in one hundred.[18]

[18] The reasons why the chance is so small are three. First and foremost is the fact above mentioned that among the five variables affecting the price level, the chance of a conspiracy, so to speak, among them so that they shall all work in the same direction at the same time is extremely small. One may "trust to luck" that if some one price-raising factor such as M should through a sudden cessation of gold mining be greatly slackened, some one or more of the other four factors are almost sure to work a partial or complete compensation. This will not be mysterious to anyone familiar with the theory of chances. It is well known that in tossing five coins the chance of all five coming up heads is only one in thirty-two.

The second reason is that the steadiness in growth of the various factors in the past makes it extremely improbable that the variation in any one, or at any rate, any considerable number of them, will be very great. The third is the increasing dominance of checks as compared with money which of itself might, paradoxically, cause a rise of prices even though, individually, both the rates of growth of money and of deposits subject to check should happen to fall.

It is possible on the theory of probabilities and certain assumptions to calculate the chances that the five magnitudes determining the price level may change in such a manner as to prevent a rise in prices. This calculation is more complicated than the mere raising of a fraction to a power as supposed above. It must take account of all combinations of chances which might produce the result under discussion. These include the chances that a deviation in one or more elements may be so great as not to require the aid of all or even of any of the other elements. To perform this calculation we make two assumptions, (1) that the ordinary law of probability or frequency applies to the present case, and (2) that the "probable deviation" is in all cases $\frac{1}{2}$ of a point in the tables. The first supposition seems admissible, and even if it should not exactly apply, the result would not be materially affected. The second supposition—that the probable deviation is $\frac{1}{2}$—is of course merely a matter of opinion; but it greatly overstates, in my

The table illustrates clearly how the increasing dominance of deposit currency will tend to push prices upward even if the growth in the volume of money should diminish by ½, *i.e.*, by 20 per cent, and this in spite of the reduction of ½ in the rate of growth of deposits which would follow from the reduction of that amount in the growth of money. In other words, in spite of the fact that the figures *both for M and for* $\frac{M'}{M}$ are assumed to be ½ a point lower in the future than in the past, the resulting rise of prices is the same in the future as in the past, owing simply to the increasing dominance of M' in controlling the result. This increasing importance of M' is illustrated by the increase in $\frac{M'}{M}$ which is represented as changing in the next 15 years from a supposed

opinion, the liability to fluctuation and therefore strengthens the conclusions which follow. By "probable deviation" in this case is, of course, meant the probable change of rates of growth from their present figures to those of the next fifteen years. To say, for instance, that the probable deviation of M is ½ means: "It is as likely as not that the annual rate of growth of M in the next fifteen years will vary from that recently experienced by ½." This implies, for instance, that as likely as not the average rate of new gold coinage combined with other additions to the world's stock of money in the next fifteen years will be 20 per cent greater or less than it is now. We have no good statistics by which to test these purely conjectural figures. As already noted, the annual output of gold during recent years has maintained a remarkably steady relation to the estimated stock of gold in the world. If we take the various available estimates of the total money in the world (in the years 1860, 1883, 1890, 1896, 1910) and compare with them the average annual yearly production of gold in the few years immediately preceding and succeeding these dates, we find that the gold production amounted in these respective years to approximately 2 per cent, 1¼ per cent, 1 per cent, 2 per cent and 3½ per cent. The "probable deviation" of any one of these figures from the mean is by the usual formula, about .6. The variability as between immediately successive periods of fifteen years each would be presumably less. For bank deposits no uniform series of statistics are available for a long series of years. The best we can do is to take the "individual deposits" in the United States for the last 15 years and the 15 years immediately preceding and to compare them with the increase in money in circulation outside of banks and United States government vaults. In this way it is found that the annual rate of increase of deposits relatively to money is exactly 3 per cent in both periods. (The money increased 1 per cent per annum in the first period and 8½ per cent in the second; while absolute deposits increased 4 per cent and 11½ per cent respectively.) For the volume of trade we likewise have no extended and uniform figures to indicate variability. We only have the rough calculation of Professor Kemmerer beginning in 1879 and extending

1¼ to a supposed 2¼. The last column shows substantially the same tendency in a different form. The relative use of money is represented as declining from a supposed 25 per cent to 15 per cent of the total use of circulating media. Even this reduced ratio, 15 per cent, would still be double the present ratio in the United States.

In view of all the facts, it would not seem strange if the rise in prices should continue in the future for at least a generation. This does not mean, of course, that a rise will occur in every individual year. On the contrary, the upward movement, for reasons elsewhere given,[19] is likely to be interrupted every decade or so by a crisis, like that of 1907. As stated in last year's article, such a crisis seems likely to incubate in a few years from the present. It is true that recent liquidations due to business men retrenching (through fear of a drastic enforcement of the Sherman law, etc., and because of the temporary recession of prices) have nearly restored normal conditions in the United States. But this liquidation has postponed rather than averted the expected crisis, and is, moreover, confined to the United States. In Canada and Germany we hear of a distended condition of credit. A restoration of

to 1908. This lacks only one year of making two periods of fifteen years each. Dividing this period into two equal parts we find the rate of growth of trade in the United States on the basis of these figures is 4½ per cent per annum in the first period and 5 per cent in the second. (See his *Money and Prices,* p. 131.) These stray straws indicate, although far from conclusively, that the assumption of half a point more or less as the "probable deviation" is conservative rather than excessive for the world's growth of money and deposits. As to their velocities I feel reasonably certain, on the basis of the considerations already given, that their rate of increase will not appreciably slacken.

The result of the calculations is: the chances that the trend of prices for the next fifteen years will not be upward are *less than one in one hundred.* The correctness of this conclusion does not depend on any assumption of accuracy in the rates of growth used in the table. Even if the true rate of growth of M should be something different from the estimate here made, the same reasoning would apply. *Whatever* is the true rate of growth, that rate must fall by ½ in order to affect the price level by ½ and the same applies to T, etc. The correctness of the conclusion does depend, however, on the assumption that the "probable deviations" used are conservative. Even if statistical research should prove that they are not always conservative, nevertheless any other reasonable assumption could still show that the chance of a fall in price is very slight indeed.

[19] *The Purchasing Power of Money,* ch. 4.

the steady upward movement in prices is pretty sure to mean a boom, and a boom is the incubation period for a crisis.

No upper limit is assigned to the possible rate of rise of prices, for the reason that we can never know when new and rich mines will be discovered or when someone will find a paying method of extracting gold from the Southern clays or even from sea water.

We conclude then that prices are almost sure to continue to rise in the next decade or two, probably as fast on the average as 2 per cent per annum.

It is interesting to observe that the United States now has the dominant role in the world drama which these statistics aim to picture. This is especially true in respect to deposits subject to check. We know that the total individual deposits in the United States are sixteen billions, and those subject to check are eight billions. In all other countries the total deposits reported are only about thirteen billions. If it be true that, in these countries also, the deposits subject to check constitute about half of the total deposits, there are as yet among these other nations only about six and one half billions of deposits subject to check. The fact that the United States deposits loom up as so large a part of the world's deposits need not surprise us when we realize how much higher the American price level is than that of other and especially oriental countries and how much more money we have per capita. India, for instance, with its teeming millions, has only 67 cents per capita, while the United States has $35 of which about half is in actual circulation. In addition we have a per capita of $150 of deposits subject to check. The fact that prices in the United States and Canada have risen more rapidly than elsewhere is, in my opinion, chiefly due to the rapid rate at which deposits in these countries have increased.

As was indicated in the June article, the unequal advances in prices in different countries will, in general, tend toward mutual correction. This will imply changes in international trade. The relatively slight rise in England tends to make England attractive to purchasers and unattractive to sellers. The opposite is true of the United States, Canada and Germany. We may therefore expect in the immediate future a great stimulus to British export trade (and to the import of gold), retardation in import trade (and in export of gold) and opposite tendencies in the trade of the United States, Canada and Germany. But these adjustments

may be irregular owing to the fact that international trade is so sensitive to the special market conditions of the limited number of articles entering into it as well as to other circumstances. Whatever the mutual adjustments of price levels between countries by international trade and the redistribution of the stocks of gold, I believe the world as a whole is destined to see for many years to come a rapidly rising tide of prices.

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